

Marine Life Protection Act Initiative



MPA Size and Spacing Evaluations of the Round 2 Draft MPA Proposals for the MLPA South Coast Study Region

**Presentation to the MLPA Blue Ribbon Task Force
July 28, 2009 • Santa Monica, CA**

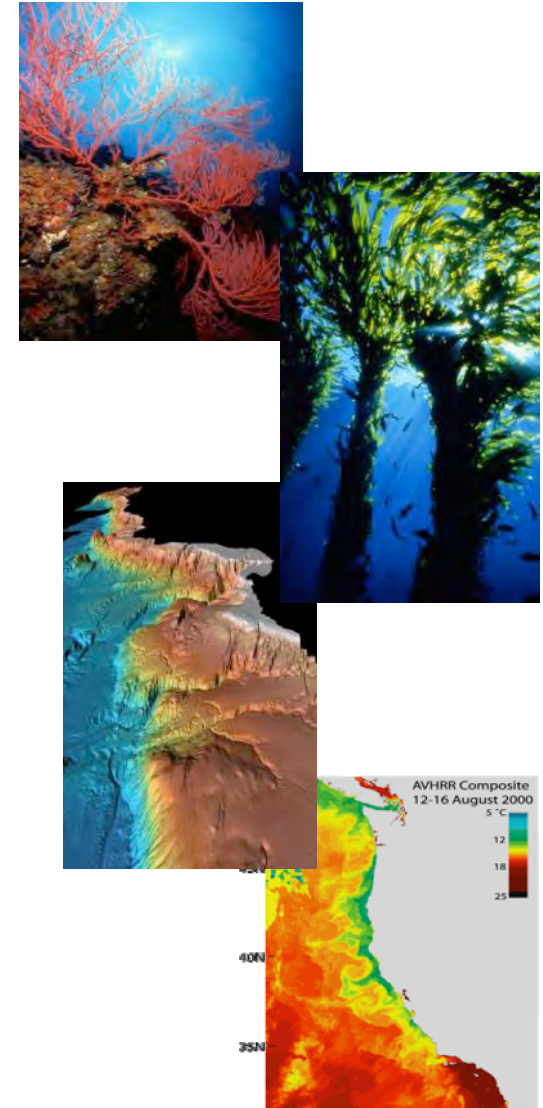
Steve Gaines • MLPA Master Plan Science Advisory Team



MLPA Goals*: Populations

1. To protect the natural diversity and function of **marine ecosystems**.
2. To help sustain and restore **marine life populations**.
3. To improve **recreational, educational, and study opportunities** in areas with minimal human disturbance.
4. To protect representative and unique **marine life habitats**.
5. Clear objectives, effective management, adequate enforcement, sound science.
6. To ensure that MPAs are designed and managed as **a network**.

** Note that this language paraphrases the MLPA goals*





Protecting Populations (Goals 2 & 6)

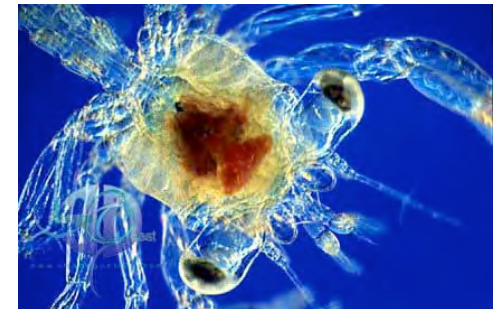
Size and Spacing



Marine protected areas (MPAs) should be large enough that adults don't move out too frequently and become vulnerable to fishing






MPAs should be close enough together that sufficient larvae can move from one to the next





Size Guidelines

-  **MPAs should have an alongshore span of 5-10 kilometers (3-6 miles) of coastline, and preferably 10-20 kilometers (6-12.5 miles)** to protect adult populations, based on adult neighborhood sizes and movement patterns. Larger MPAs should be required to fully protect marine birds, mammals, and migratory fish.
-  **MPAs should extend from the intertidal zone to deep waters offshore** to protect the diversity of species that live at different depths and to accommodate the ontogenetic movement of individuals to and from nursery or spawning grounds to adult habitats.
-  Combined and simplified, these two guidelines yield:
 - Minimum range of 9-18 square miles**
 - Preferred range of 18-36 square miles**



Size Analysis Methods



Measure individual MPA areas



Combine contiguous MPAs into MPA clusters



Consider level of protection

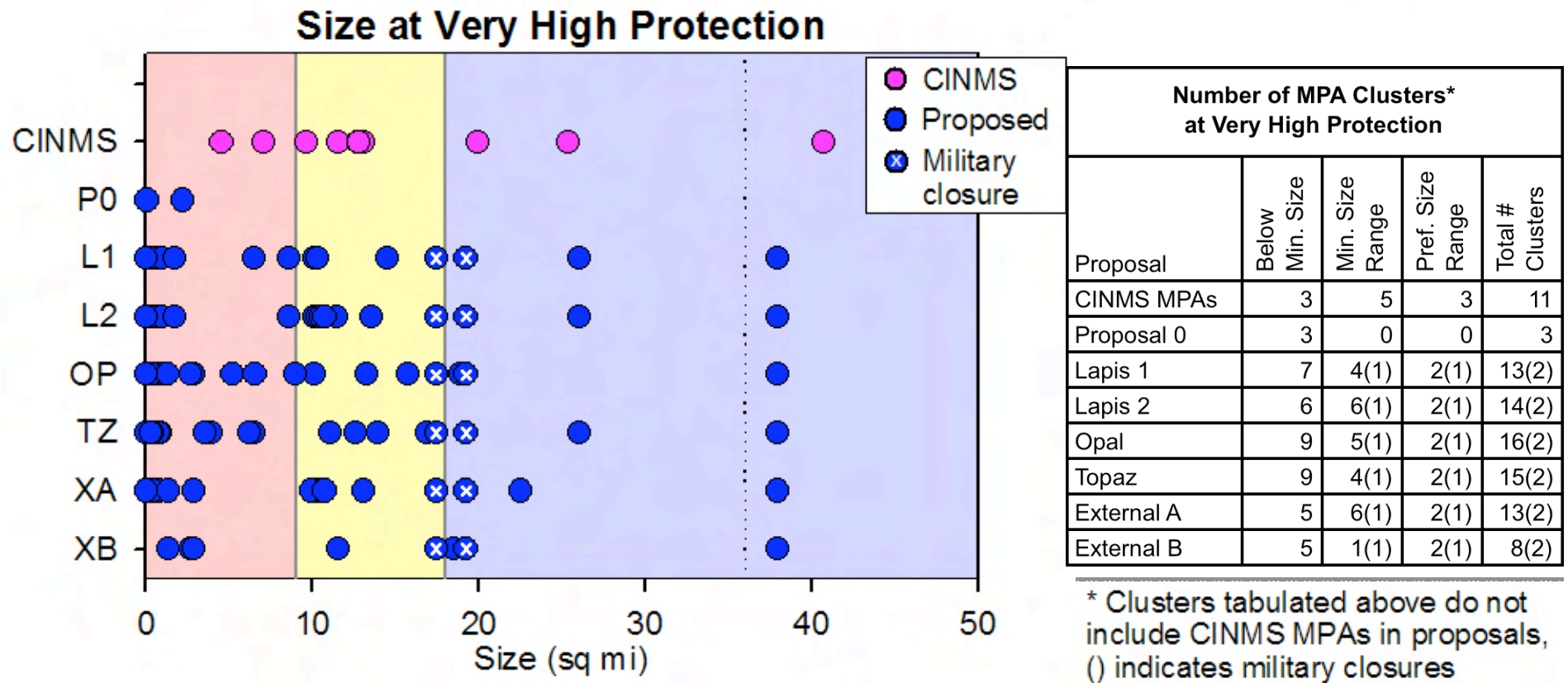


Tabulate MPA cluster areas relative to minimum and preferred guidelines



Estuarine MPAs are not included in size evaluation

Cluster Sizes: Very High Protection



Most proposals (except XB) have similar numbers of SMRs

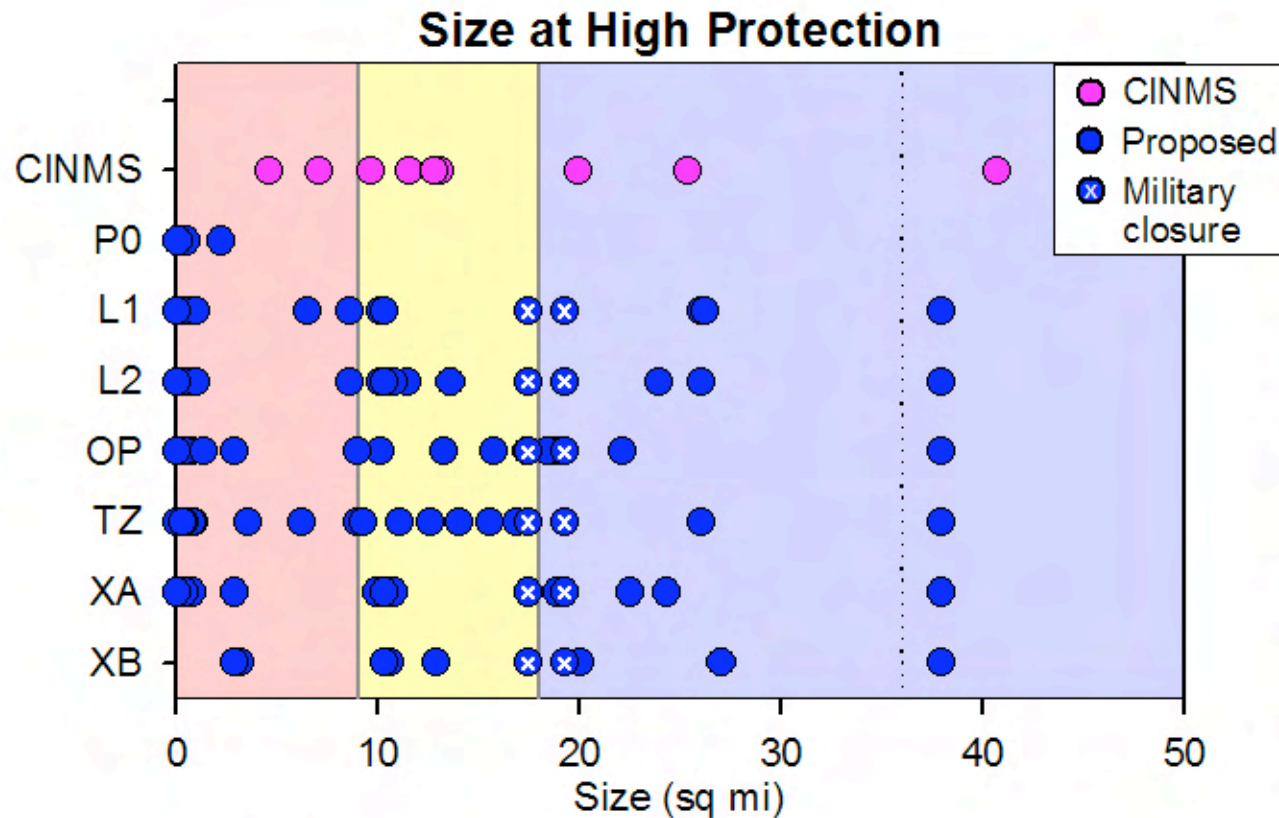
All proposals have 2 SMRs in preferred size range

Most SMRs below minimum size for all proposals

SMR = state marine reserve

CINMS MPAs = state MPAs within the Channel Islands National Marine Sanctuary

Cluster Sizes: High Protection*



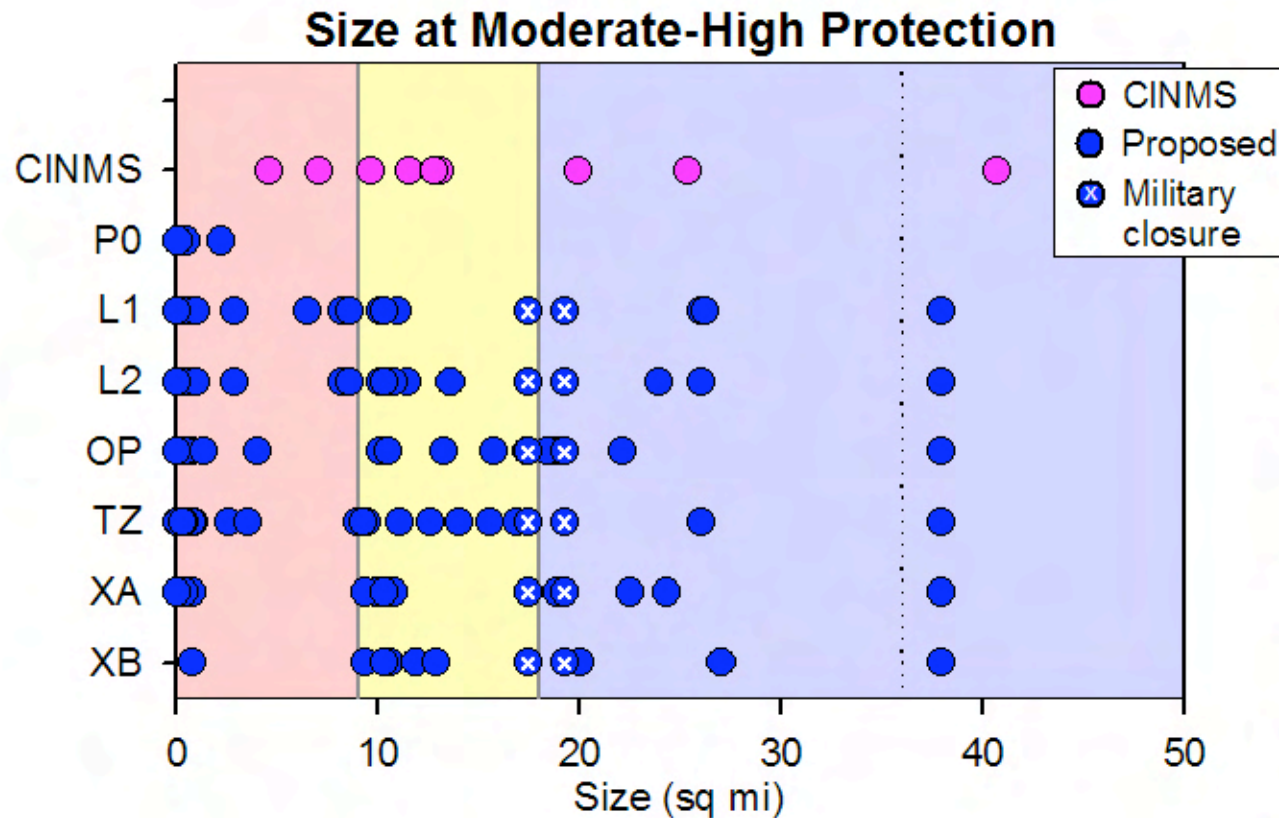
Number of MPA Clusters* at High Protection				
Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
CINMS MPAs	3	5	3	11
Proposal 0	4	0	0	4
Lapis 1	6	4(1)	3(1)	13(2)
Lapis 2	5	6(1)	3(1)	14(2)
Opal	6	6(1)	4(1)	16(2)
Topaz	8	6(1)	2(1)	16(2)
External A	4	5(1)	4(1)	13(2)
External B	3	3(1)	3(1)	9(2)

* Clusters tabulated above do not include CINMS MPAs in proposals, () indicates military closures

Clusters in all proposals moved into the preferred size range at high protection

* Evaluated for all open coast MPAs at or above high protection

Cluster Sizes: Mod-high Protection*



Number of MPA Clusters* at Moderate-High Protection				
Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
CINMS MPAs	3	5	3	11
Proposal 0	4	0	0	4
Lapis 1	8	5(1)	3(1)	16(2)
Lapis 2	7	6(1)	3(1)	16(2)
Opal	6	6(1)	4(1)	16(2)
Topaz	9	8(1)	2(1)	19(2)
External A	4	6(1)	4(1)	14(2)
External B	1	6(1)	3(1)	10(2)

* Clusters tabulated above do not include CINMS MPAs in proposals, () indicates military closures

Some additional MPAs and clusters in the minimum size range at mod-high protection

* Evaluated for all open coast MPAs at or above mod-high protection



Size: Conclusions



Most proposals similar in the number and size range of MPAs (External B is the exception)



All proposals have 2 SMRs within the preferred size range

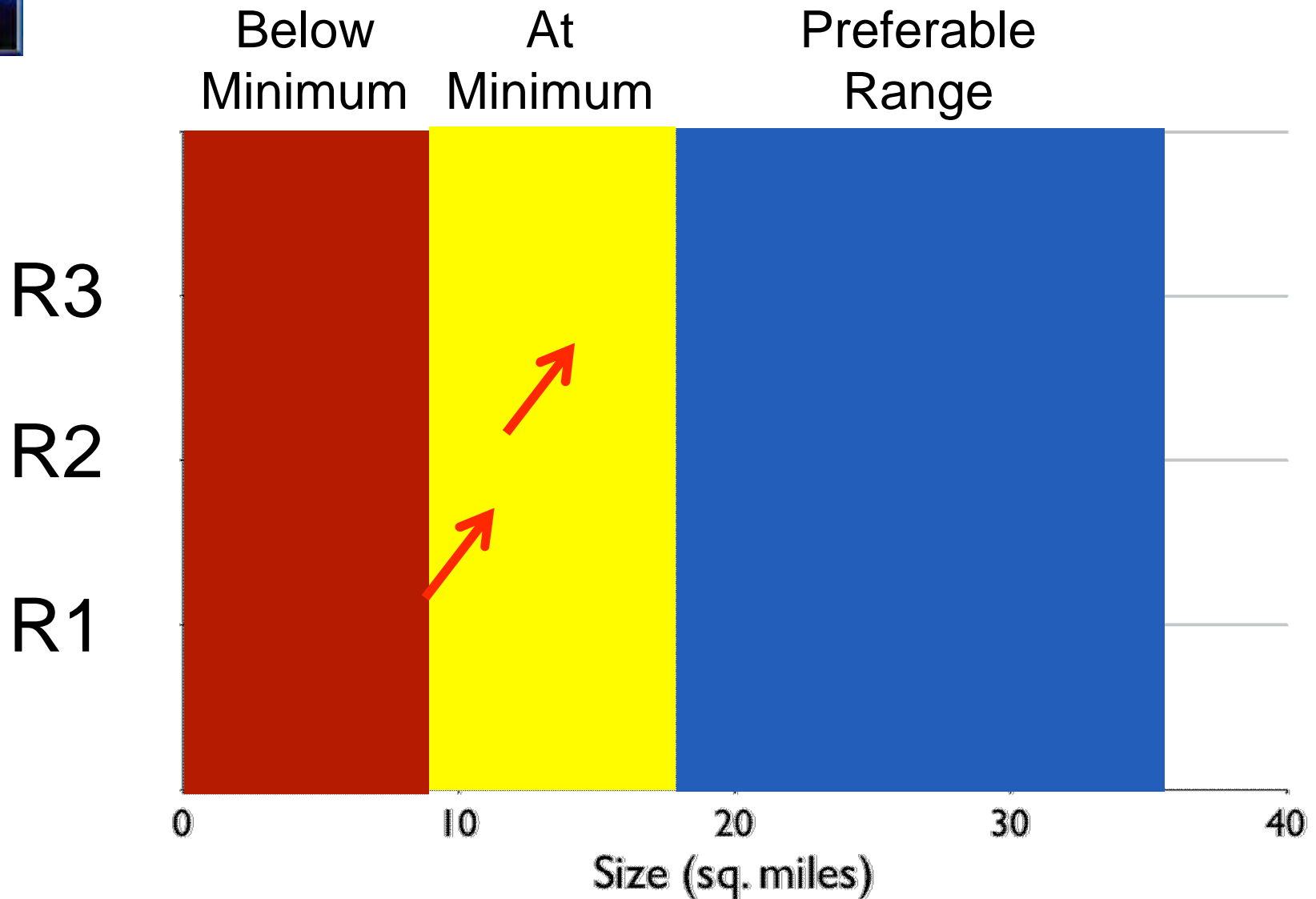


All proposals have many MPAs that do not meet minimum size guidelines



Trends in MPA size differ from previous study regions

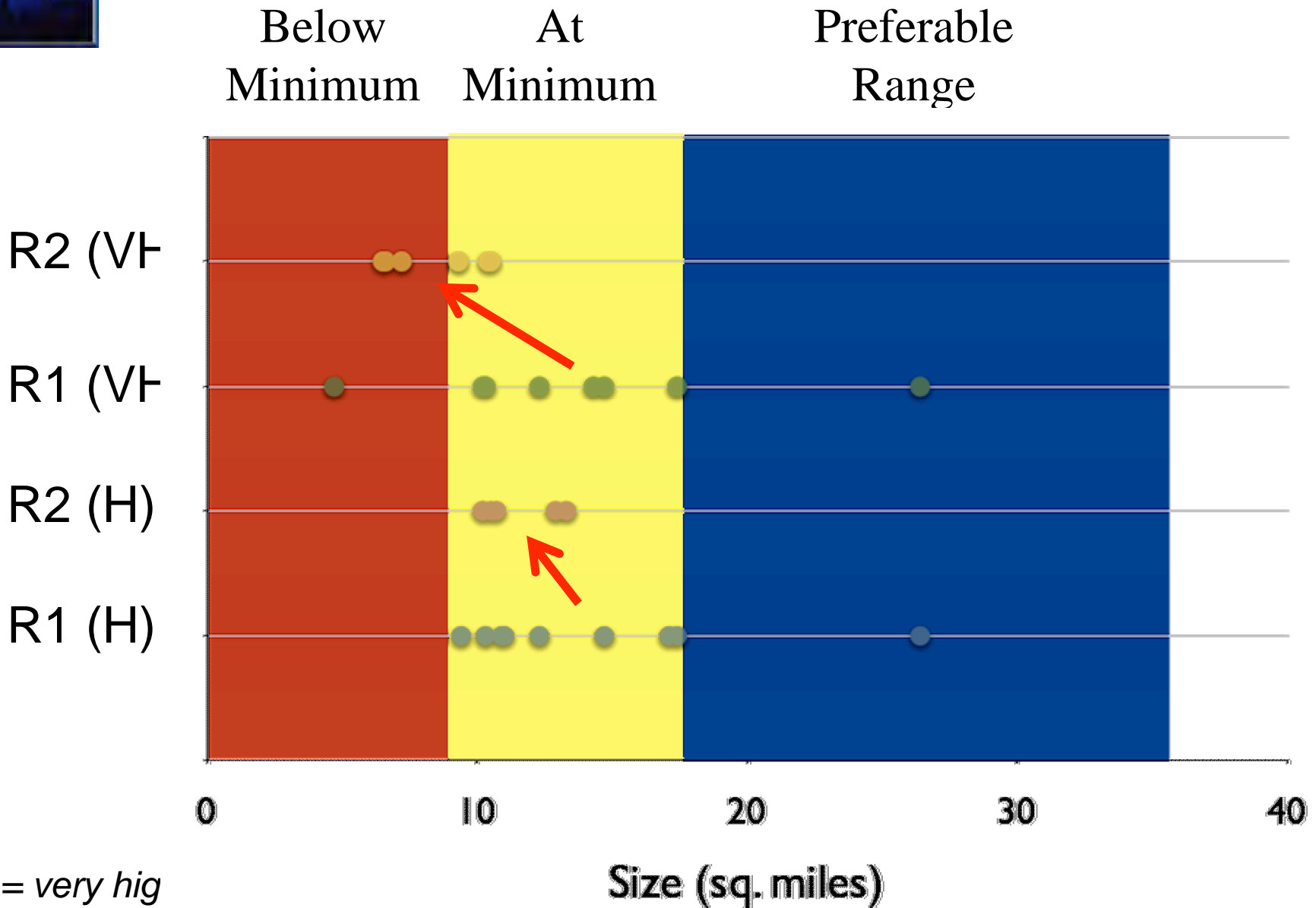
North Central Coast Average MPA Cluster Sizes (High Protection)



R1 = Round 1 Arrays R2 = Round 2 Draft Proposals R3 = Round 3 SCRSG Proposals



South Coast Median MPA Cluster Sizes





Protecting Populations

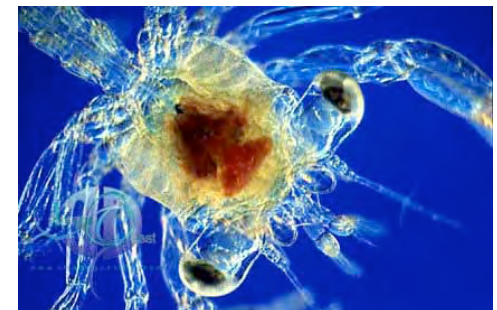
Size and Spacing



MPAs should be large enough that adults don't move out of them too frequently and become vulnerable to fishing



MPAs should be close enough together that sufficient larvae can move from one to the next





Design Guidelines: Goals 2 and 6



MPAs should be placed within 50-100 kilometers (31-62 miles) of each other to facilitate dispersal and connectedness of important bottom-dwelling fish and invertebrate groups among MPAs



Because many populations are habitat-specific, spacing is evaluated for each habitat



Spacing Analysis Methods



MPAs or clusters must meet the minimum size guidelines (9 square miles) to be included in the spacing analysis



Identify the habitats included in sufficient amounts to count as a “replicate” within each MPA cluster



Measure gaps between adjacent MPA clusters that contain a given habitat



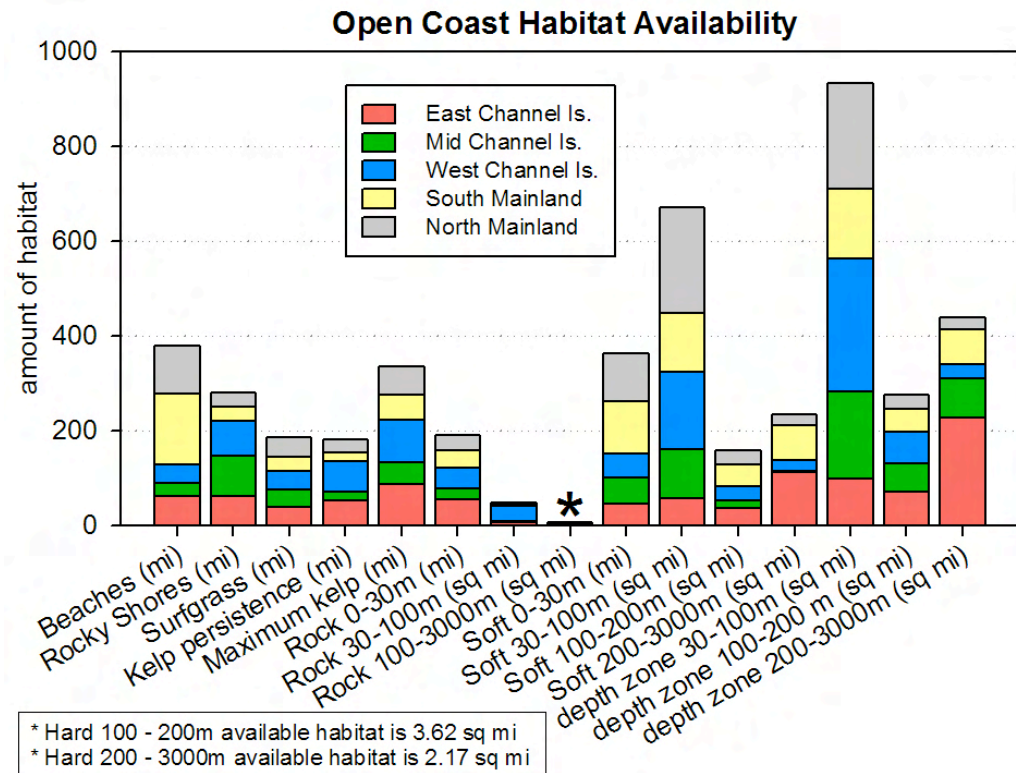
Spacing is calculated for mainland MPAs only



Habitat Availability and Spacing

Habitat availability and distribution limits spacing

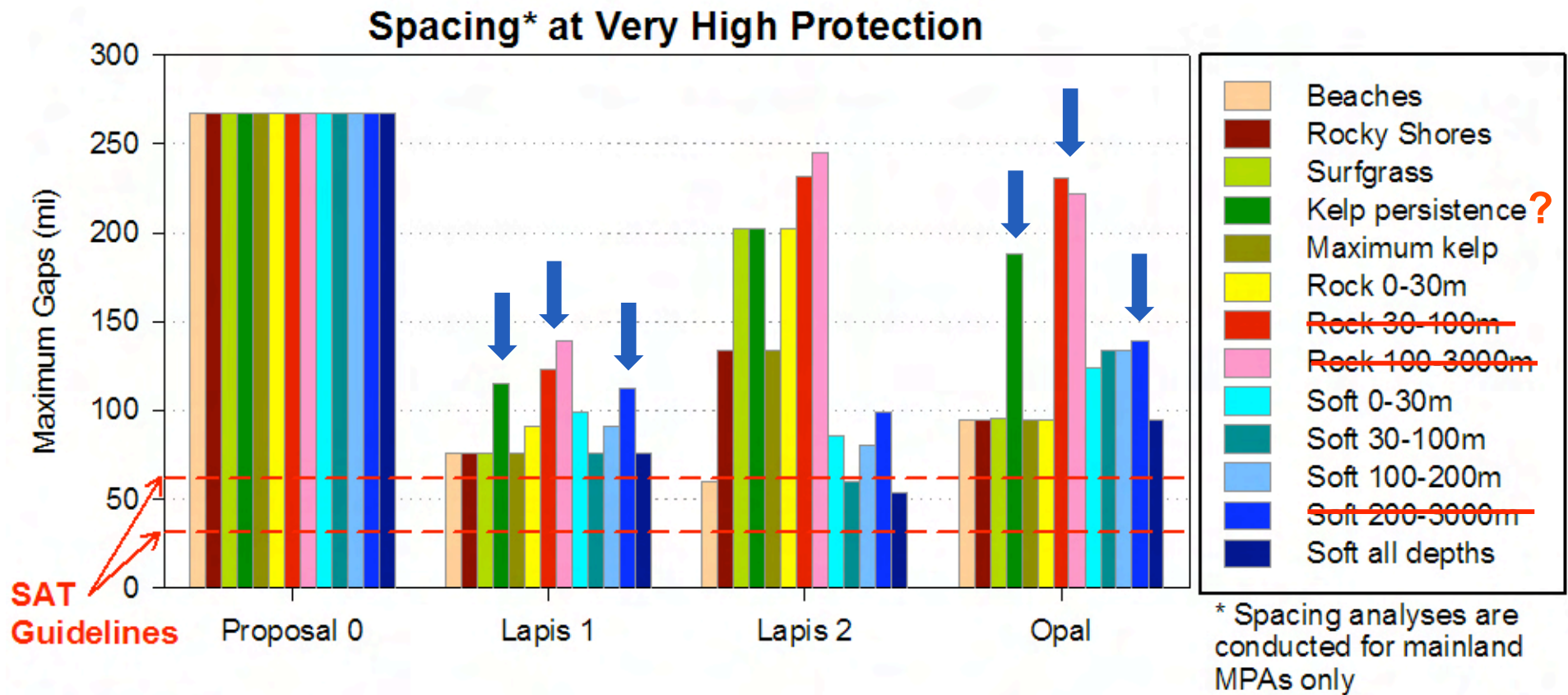
- >30 meter rocky habitats are rare on the mainland
- 0-30 meter habitat is mapped by a proxy line
- >200 meter soft bottom on the mainland occurs mostly in canyons





Max Gaps: Very High Protection

First 3 of 6 proposals

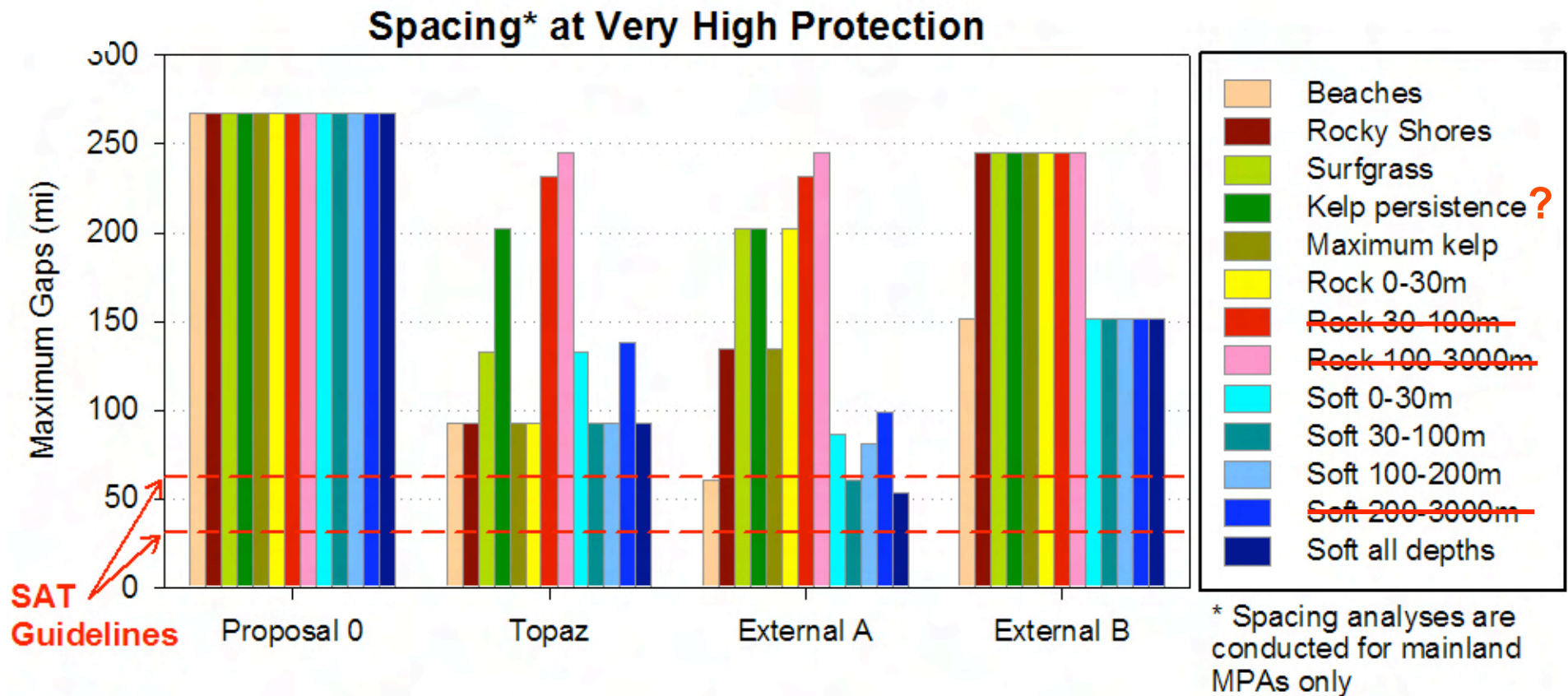


Not possible to meet spacing guidelines for >30 meter rock or >200 meter soft
 Best possible spacing for persistent kelp (at least 3 of 7 years) is ~ 75 miles due to gap between Palos Verdes and San Elijo area



Max Gaps: Very High Protection

Next 3 of 6 proposals



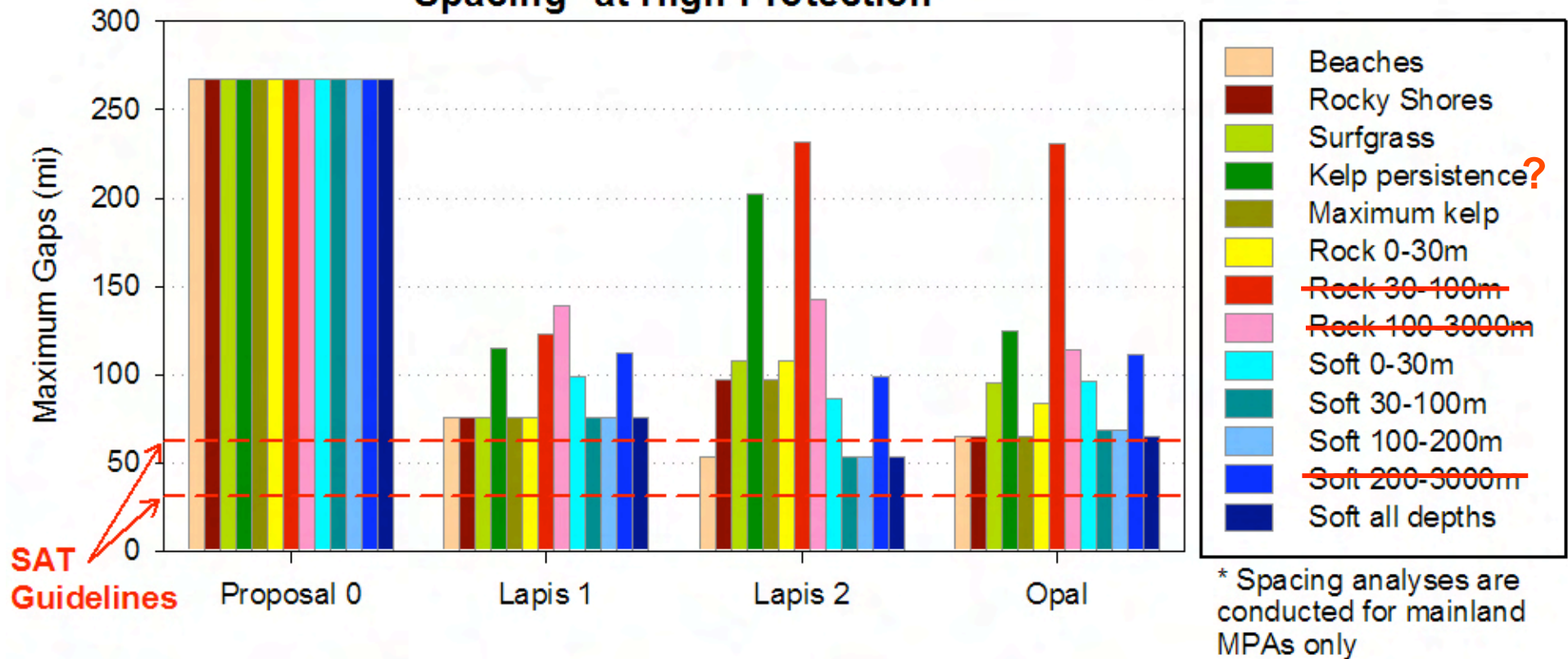
Not possible to meet spacing guidelines for >30 meter rock or >200 meter soft
Best possible spacing for persistent kelp (at least 3 of 7 years) is ~ 75 miles due to gap between Palos Verdes and San Elijo area



Max Gaps: High Protection

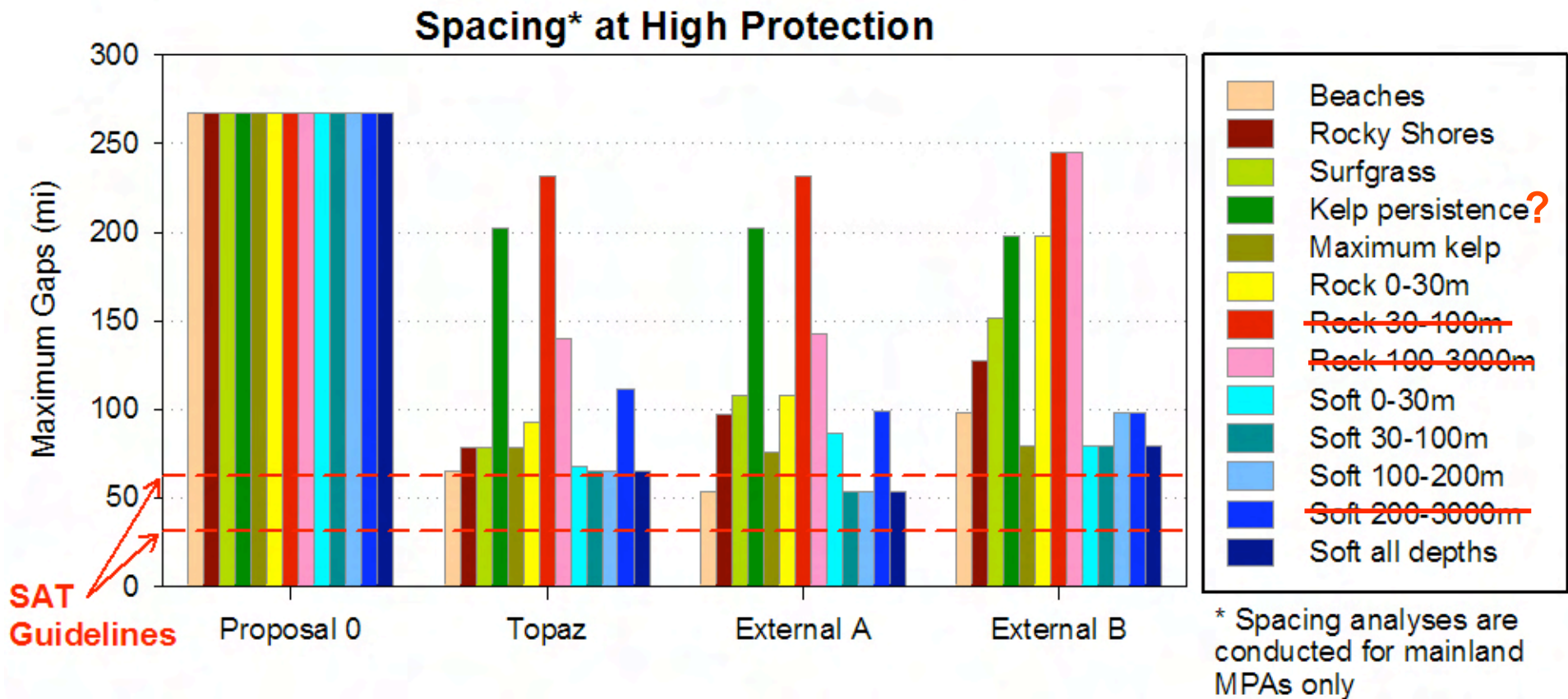
First 3 of 6 proposals

Spacing* at High Protection





Max Gaps: High Protection

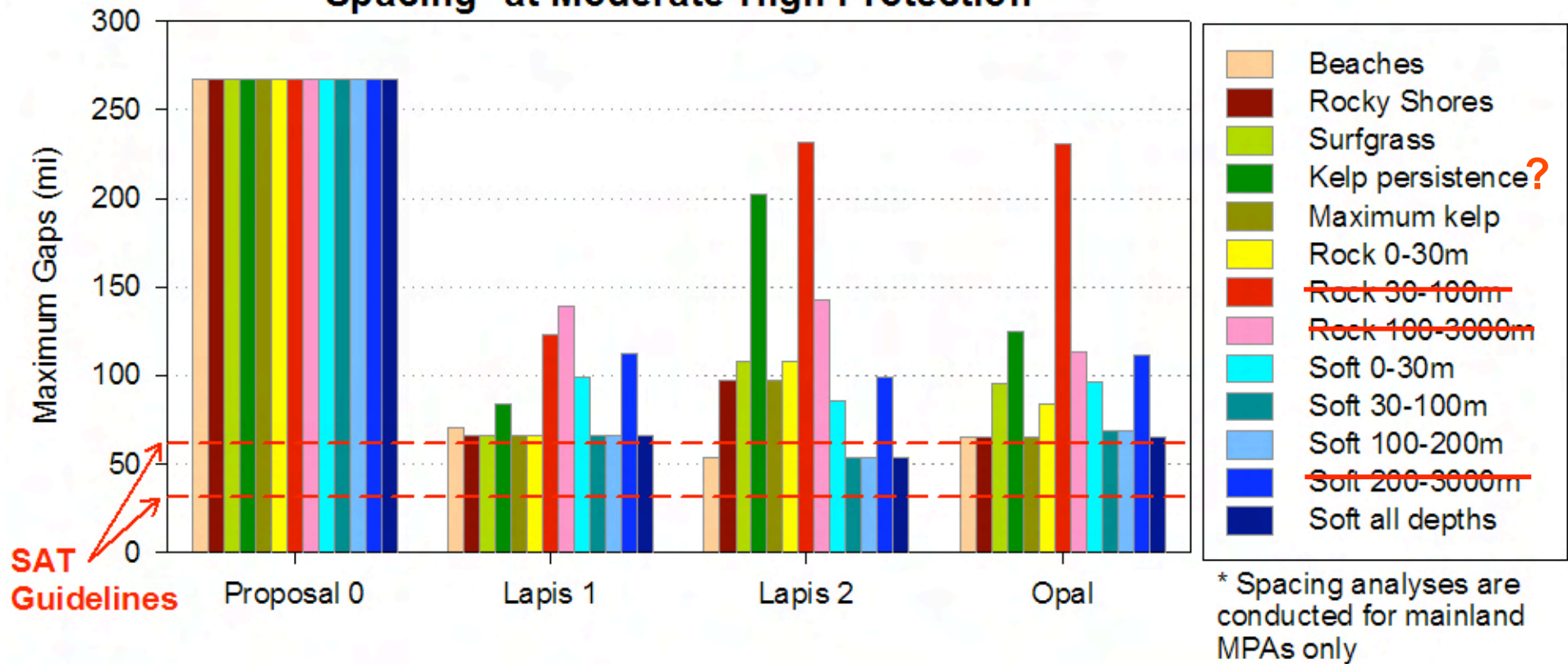




Max Gaps: Mod-high Protection

First 3 of 6 proposals

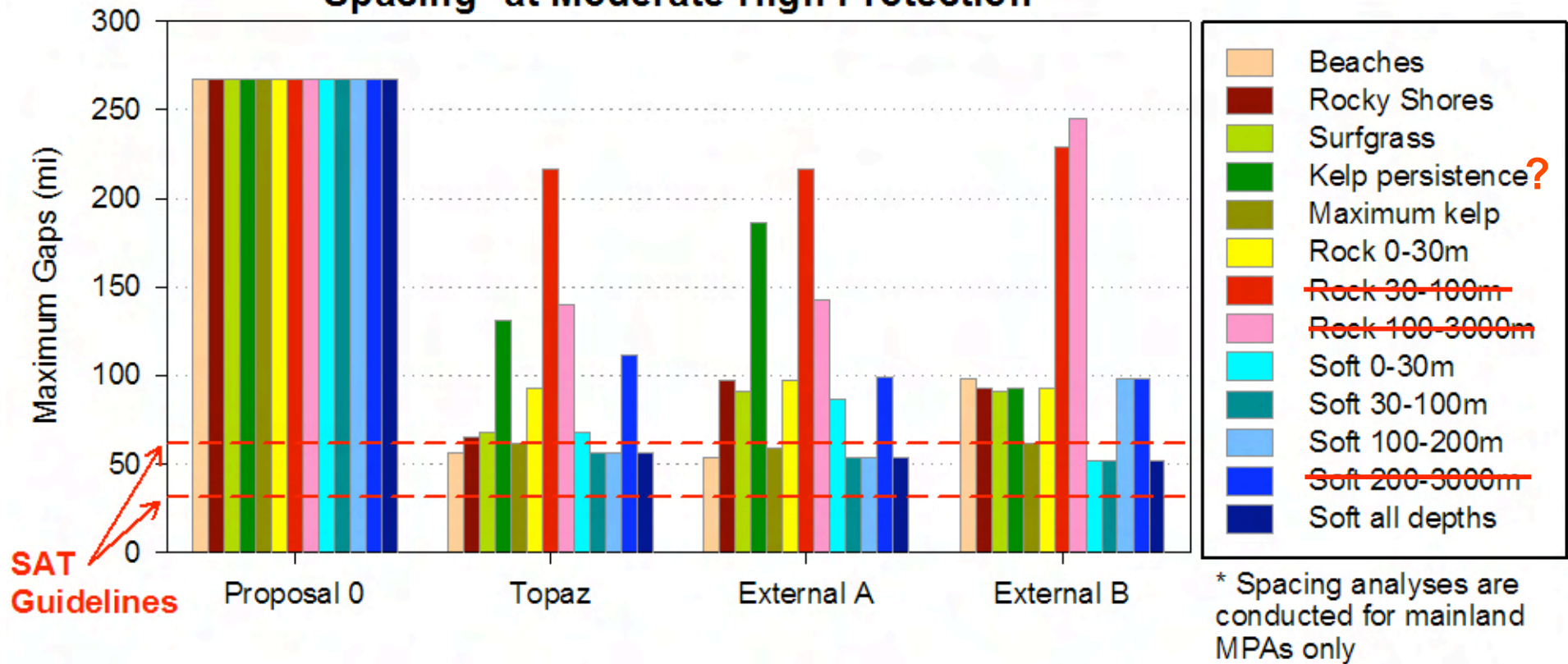
Spacing* at Moderate-High Protection





Max Gaps: Mod-high Protection

Spacing* at Moderate-High Protection





Spacing: Conclusions



Spacing guidelines may be impossible to meet for some habitats



No proposals meet spacing guidelines for all possible habitats



Lapis 1 comes closest to meeting spacing guidelines for all possible habitats, followed by Topaz/Opal